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# A gas-phase chemical reduction process

*"At ECO LOGIC our business is the future. It is our intent to make our environment clean and safe for future generations."*

Dr. Douglas J. Hallet  
Vice Chairman  
ELI Eco Logic International Inc.  
Rockwood, Ontario.

## THE COMPANY

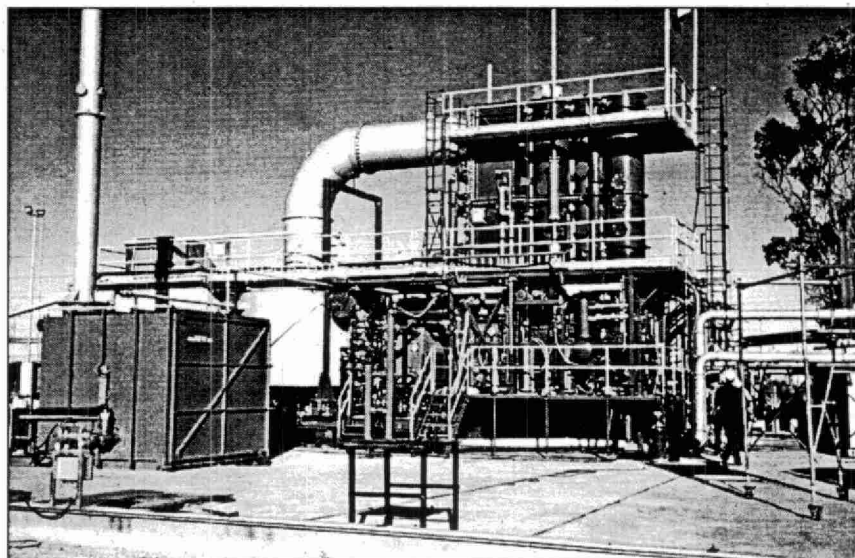
ELI Eco Logic International Inc. (ECO LOGIC) was formed in 1986 to create a commercially viable alternative to incineration for the destruction of organic hazardous waste.

ECO LOGIC is a publicly traded company listed on the Toronto Stock Exchange.

## THE CHALLENGE

ECO LOGIC developed its patented closed-loop system as an innovative alternative to incineration. What was needed was a method of removing organic contaminants from the environment in a manner which controls emissions and eliminates formation of hazardous by-products.

The ECO LOGIC Process is a unique method of destroying hazardous organic contaminants, such as polychlorinated biphenyls (PCBs) by converting them into recyclable, reusable or safely disposable products. The process uses a patented gas-phase chemical reduction reaction. The technology is applicable to a wide range of contaminants in a variety of matrices including soils, liquids, and solids. Further, the closed-loop design ensures there are no uncontrolled emissions. The ECO LOGIC Process is not an incinerator so the risk of forming dioxins and furans is minimized.



*The ECO LOGIC Process for destruction and recycling of organic contaminants.*

## TECHNOLOGY DESCRIPTION

The ECO LOGIC Process uses gas phase chemical reduction to reform organic contaminants into reusable or recyclable materials. These reactions take place in a hydrogen-rich reducing atmosphere at elevated temperatures under nominal pressure.

The process breaks down any organic compound and reforms them into primarily methane or natural gas. This gas product is siphoned from the process, stored in a tank and tested. Following the analytical verification phase, the product gas may be reused at the site to heat various ancillary process components. Due to the lack of an oxidizing environment, treated metal components lend themselves well to scrap metal recycling following analytical testing.

Technology demonstrations have proven that the ECO LOGIC Process can achieve at least 99.9999 per cent destruction and removal efficiencies when applied to such organic contaminants as PCBs, polyaromatic hydrocarbons (PAHs), and pesticide residuals.

## TECHNOLOGY OPPORTUNITIES

ECO LOGIC has been developing this technology since 1986 and is now able to offer it commercially. The technology has been proven to be effective for high strength organic contaminants such as PCBs.

Currently, ECO LOGIC is pursuing other applications for the technology. These include using it to treat chemical warfare agents, Petro chemical wastes, low-level radioactive mixed waste and municipal/industrial sewage sludge or biosolids. The U.S. Army is investigating the use of the ECO LOGIC Process for the destruction of munitions that contain chemical warfare agents.

The first commercial-scale system was constructed in Ontario and shipped to Australia where it is processing obsolete pesticide residuals (DDT) and high strength PCB-contaminated oils and electrical equipment. General Motors of Canada Limited has contracted the second commercial-scale unit to recycle their inventory of PCB-contaminated electrical equipment, settled solids and other bulk solids.

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## **PARTNERSHIP IN POLLUTION PREVENTION AND RESOURCE CONSERVATION**

Two phases of the development of this technology were partially supported by the ministry.

This technology has received support from a number of partners during the development phase including the Canadian Department of National Defense under the Defense Industry Research Program, the US Environmental Protection Agency under the SITE Program, Environment Canada under the Great Lakes Cleanup Fund and the Canada-Ontario DESRT Program.

Industrial companies located in Ontario may seek ministry/ industry services which will help them:

- \* reduce, reuse and recycle solid waste;
- \* effectively remediate historic pollution and destroy hazardous contaminants;
- \* reduce or eliminate liquid effluent and gaseous emissions;
- \* use energy and water more efficiently.

Equipment and services supply companies can benefit from the information provided on technologies identified for business development.

## **FOR FURTHER INFORMATION, PLEASE CONTACT:**

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## **MINISTRY OF THE ENVIRONMENT SERVICES**

For information on Ministry of the Environment assistance to industry, please contact the Environmental Partnerships Branch at  
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